

Appl. No. 10/708,330
Amdt. dated April 13, 2006
Reply to Office action of January 24, 2006

REMARKS/ARGUMENTS

1.Rejection of claims 5 and 13 under 35 U.S.C 112:

Response:

Claims 5 and 13 have been cancelled.

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2.Rejection of claims 1, 2, 4, 6-10, 12 and 14-16 under 35 U.S.C. 103(a) as being unpatentable over Kodate (US 5,748,266) in view of Rho et al. (US 6,862,050) and Yamada (US 6,795,141):

Response:

10 Claim 1 has been amended to overcome this rejection. Specifically, the limitation "each photo spacer being in direct contact with edge portions of adjacent color filters" has been added to claim 1. This limitation finds support in Fig.4 for instance, and no new matter is entered.

15 The amended claim 1 is listed hereinafter for reference:

Claim 1: A method for fabricating a liquid crystal display (LCD) with a uniform common voltage, the method comprising:

providing a lower substrate having a display area and a non-display area;

20 forming a plurality of scan lines, a plurality of common electrodes, and a plurality of common electrode pads on an upper surface of the lower substrate simultaneously, wherein the common electrodes are used for transmitting a common voltage and are positioned at the same plane as a plane where the common electrode pads are
25 positioned on the lower substrate, and the common electrode pads are electrically connected to the common electrodes;

forming a plurality of data lines on the upper surface of the lower

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substrate, wherein the data lines are arranged perpendicular to the scan lines to form a pixel matrix in the display area, the pixel matrix comprising a plurality of pixels;
providing an upper substrate having a plurality of color filters, and
5 black matrices disposed between adjacent color filters;
forming a plurality of photo spacers on the upper substrate, each photo spacer being in direct contact with edge portions of adjacent color filters, and corresponding to one of the black matrices and one of the common electrode pads on the lower substrate;
10 forming a conductive material layer on the upper substrate to make the conductive material layer cover the surface of the photo spacers;
combining the upper substrate and the lower substrate face to face by using the photo spacers to support a space between the upper substrate and the lower substrate, and electrically connecting the
15 conductive material layer covering the surface of each of the photo spacers to the common electrode pads corresponding to each of the photo spacers; and
filling a plurality of liquid crystal molecules in the space between the upper substrate and the lower substrate, and sealing the space
20 between the upper substrate and the lower substrate.

Regarding US 5,748,266, Kodate lacks disclosure of:

- 1) the spacers are photo spacers; and
 - 2) each of the photo spacers corresponds to one of the black matrices.
- 25

Regarding US 6,862,050, Rho discloses an LCD having photo spacers. However, the photo spacers 190 of Rho's teaching are disposed on the surface of the common electrode 180 as shown in Rho's Figs.13-14. In

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other words, the photo spacers 190 are in contact with the common electrode 180, instead of the color filter 160. Therefore, Rho fails to teach the limitation "each photo spacer being in direct contact with edge portions of adjacent color filters" of the amended claim 1.

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Regarding US 6,795,141, Yamada discloses an LCD having spacers. However, The spacers 180 disclosed by Yamada are disposed on the surface of the electrode layer 140 as shown in Yamada's Fig.6. In such a case, Yamada also fails to teach the limitation "the spacers are in direct contact with the edge portions of the color filters" recited in the amended claim 1.

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It is also appreciated that the inherent strong adhesion between the photo spacers and the color filters is able to prevent the photo spacers from being damaged if a larger force is applied to the photo spacers in successive processes.

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Since none of the cited arts has disclosed the limitation "the spacers are in direct contact with the edge portions of the color filters", the applicant believes the amended claim 1 would not have been obvious to a person of ordinary skill in the art to employ photo spacers in view of the cited prior arts. Thus, claim 1 should be allowed, and reconsideration of claim 1 is politely requested. Claims 2, 4, and 6-8 are dependent on claim 1, and should be allowed if claim 1 is found allowable. Reconsideration of claims 2, 4, and 6-8 is therefore politely requested.

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Claim 9 has been amended to overcome this rejection. Specifically, the limitation "each photo spacer is in direct contact with edge portions of adjacent color filters" has been added to claim 9. This limitation finds

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support in Fig.4 for instance, and no new matter is entered.

The amended claim 9 is listed hereinafter for reference:

Claim 9 (currently amended): An LCD with a uniform common voltage, the

5 LCD comprising:

a lower substrate having a display area and a non-display area on an upper surface thereof, the lower substrate comprising:

10 a plurality of scan lines and a plurality of data lines, wherein the data lines are arranged perpendicular to the scan lines to form a pixel matrix in the display area, the pixel matrix comprising a plurality of pixels;

a plurality of common electrodes for transmitting a common voltage; and

15 a plurality of common electrode pads electrically connected to the common electrodes, the common electrode pads and the common electrodes are positioned at a same plane on the lower substrate;

an upper substrate positioned on the lower substrate oppositely, the upper substrate comprising:

20 a plurality of color filters, and black matrices disposed between adjacent color filters;

25 a plurality of photo spacers positioned on a ~~bottom surface of the~~ upper substrate for supporting a space between the upper substrate and the lower substrate, wherein each of the photo spacers is in direct contact with edge portions of adjacent color filters and corresponding ~~corresponds~~ to one of the black matrices and one of the common electrode pads of the lower substrate; and

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5 a conductive material layer positioned on the ~~bottom surface of~~
the upper substrate covering the photo spacers, wherein the
conductive material layer covering the photo spacers is
connected to each of the common electrode pads
corresponding to each of the photo spacers; and
a plurality of liquid crystal molecules filled in the space between the
upper substrate and the lower substrate.

Regarding US 5,748,266, Kodate lacks disclosure of:

- 10 1) the spacers are photo spacers; and
2) each of the photo spacers corresponds to one of the black matrices.

Regarding US 6,862,050, Rho discloses an LCD having photo spacers.
However, the photo spacers 190 of Rho's teaching are disposed on the
15 surface of the common electrode 180 as shown in Rho's Figs.13-14. In
other words, the photo spacers 190 are in contact with the common
electrode 180, instead of the color filter 160. Therefore, Rho fails to teach
the limitation "each photo spacer being in direct contact with edge portions
of adjacent color filters" of the amended claim 9.

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Regarding US 6,795,141, Yamada discloses an LCD having spacers.
However, The spacers 180 disclosed by Yamada are disposed on the surface
of the electrode layer 140 as shown in Yamada's Fig.6. In such a case,
Yamada also fails to teach the limitation "the spacers are in direct contact
25 with the edge portions of the color filters" recited in claim 9.

Since none of the cited arts has disclosed the limitation "the spacers are
in direct contact with the edge portions of the color filters", the applicant

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believes the amended claim 9 would not have been obvious to a person of ordinary skill in the art to employ photo spacers in view of the cited prior arts. Thus, claim 9 should be allowed, and reconsideration of claim 9 is politely requested. Claims 10, 12, and 14-16 are dependent on claim 9, and should be allowed if claim 9 is found allowable. Reconsideration of claims 10, 12, and 14-16 is therefore politely requested.

3.Rejection of claims 3 and 11 under 35 U.S.C. 103(a) as being unpatentable over Kodate (US 5,748,266) in view of Rho et al. (US 6,862,050) and Yamada (US 6,795,141) as discussed above and further in view of Kirauchi et al (US 5,917,572):

Response:

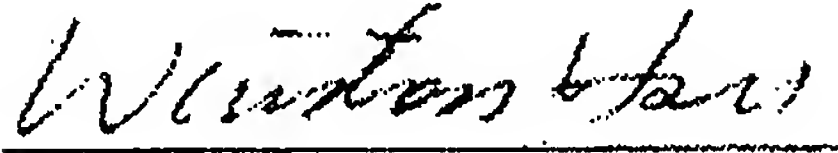
Claim 3 is dependent on claim 1, and should be allowed if claim 1 is found allowable. Reconsideration of claim 3 is therefore politely requested.

Claim 11 is dependent on claim 9, and should be allowed if claim 9 is found allowable. Reconsideration of claim 9 is therefore politely requested.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

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Sincerely yours,



Date: 04.13.2006

Winston Hsu, Patent Agent No. 41,526

5 P.O. BOX 506, Merrifield, VA 22116, U.S.A.

Voice Mail: 302-729-1562

Facsimile: 806-498-6673

e-mail : winstonhsu@naipo.com

- 10 Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 12 hours behind the Taiwan time, i.e. 9 AM in D.C. = 9 PM in Taiwan.)